

# **DRAFT CRUISE INSTRUCTIONS**

## ***FOCI***

**NOAA Ship *MILLER FREEMAN*, Cruise MF-04-04**  
**April 6 – April 22, 2004**  
**Chief Scientist – Carol L. DeWitt, NOAA/PMEL**

### **1.0 DRAFT CRUISE INSTRUCTIONS**

**1.1 Cruise Title** – Fisheries-Oceanography Coordinated Investigations (FOCI).

**1.2 Cruise Numbers**

**1.2.1 Cruise Number** – MF-04-04

**1.2.2 FOCI Number** – 2MF04

**1.3 Cruise Dates** – April 6 – April 22, 2004

**1.3.1 Departure** – Depart Kodiak, Alaska, at 1500 on Tuesday, April 6, 2004

**1.3.2 Arrival** – Arrive Dutch Harbor, Alaska, on Thursday, April 22, 2004.

**1.4 Operating Area** – Gulf of Alaska and Bering Sea.

### **2.0 CRUISE OVERVIEW**

**Cruise Objectives** – Fisheries-Oceanography Coordinated Investigations (FOCI) is an effort by National Oceanic and Atmospheric Administration (NOAA) and associated academic scientists. FOCI's goal is to understand the effects of abiotic and biotic variability on ecosystems of the North Pacific Ocean and Bering Sea in order to discern the physical and biological processes that determine recruitment variability of commercially valuable finfish and shellfish stocks in Alaskan waters.

The primary objective of the cruise will be the recovery and deployment of moorings in the Gulf of Alaska and Bering Sea. The second objective will be physical oceanographic property sampling at and near the mooring locations.

**2.1 Participating Organizations**

NOAA – Pacific Marine Environmental Laboratory (PMEL)  
7600 Sand Point Way N.E., Seattle, Washington 98115-6439

**2.2**

## **Personnel**

### **2.2.1 Chief Scientist**

<b>Name</b>	<b>Gender</b>	<b>Affiliation</b>	<b>E-mail Address</b>
Carol L. DeWitt (206) 526-6808	Female	PMEL	<a href="mailto:Carol.DeWitt@noaa.gov">Carol.DeWitt@noaa.gov</a>

### **2.2.2 Other Participating Scientists**

<b>Name</b>	<b>Gender</b>	<b>Affiliation</b>	<b>E-mail Address</b>
Carol L. DeWitt	Female	PMEL	<a href="mailto:Carol.DeWitt@noaa.gov">Carol.DeWitt@noaa.gov</a>
William J. Floering	Male	PMEL	<a href="mailto:William.Floering@noaa.gov">William.Floering@noaa.gov</a>
Calvin W. Mordy	Male	PMEL	<a href="mailto:Calvin.W.Mordy@noaa.gov">Calvin.W.Mordy@noaa.gov</a>
Earl Roskie	Male	PMEL	<a href="mailto:Earl.Roskie@noaa.gov">Earl.Roskie@noaa.gov</a>
Peter D. Proctor	Male	PMEL	<a href="mailto:Peter.Proctor@noaa.gov">Peter.Proctor@noaa.gov</a>
TBN	Male	PMEL	
TBN	Female	Teacher at Sea	

## **2.3 Administrative**

### **2.3.1 Ship Operations**

Marine Operations Center, Pacific  
1801 Fairview Avenue East, Seattle, Washington 98102-3767  
Telephone: (206) 553-4548  
Facsimile: (206) 553-1109

Commander Michele G. Bullock, NOAA  
Chief, Operations Division (MOP1)  
Telephone: (206) 553-8705  
Cellular: (206) 390-7527  
E-mail: [Michele.Bullock@noaa.gov](mailto:Michele.Bullock@noaa.gov)

Larry Mordock  
Deputy Chief, Operations Division (MOP1x1)  
Telephone – Work: (206) 553-4764  
Home: (206) 365-3567  
Cellular: (206) 465-9316  
E-mail: [Larry.Mordock@noaa.gov](mailto:Larry.Mordock@noaa.gov)

### **2.3.2 Scientific Operations**

Dr. Phyllis J. Stabeno, NOAA/PMEL  
Telephone: (206) 526-6453  
E-mail: [Phyllis.Stabeno@noaa.gov](mailto:Phyllis.Stabeno@noaa.gov)

### 3.0 OPERATIONS

#### 3.1 Data To Be Collected

**3.1.1 Scientific Computer System (SCS)** – The ship's SCS shall operate throughout the cruise, acquiring and logging data from navigation, meteorological, oceanographic, and fisheries sensors. See *FOCI Standard Operating Instructions for NOAA Ship MILLER FREEMAN* (SOI 5.2) for specific requirements.

**3.2 Staging Plan** – Less than 10,000 pounds of equipment – subject to space availability – will be loaded onto the ship prior to its departure from Seattle, Washington, on Monday, February 16, 2004. The remaining equipment will be shipped to Kodiak, Alaska, and loaded aboard the ship beginning on Sunday, April 4, 2004. See Section [9.1 Cruise MF-04-04 Equipment Inventory](#) for a complete equipment inventory. The scientific party will be responsible for arranging vehicles for moving their equipment from the airport and/or to the ship.

**3.3 De-staging Plan** – Upon completion of Cruise MF-04-05, FOCI personnel will arrange for shipping equipment back to Seattle, Washington. The scientific party will be responsible for arranging vehicles for moving their equipment from the ship to the airport and/or docks and coordinating with the ship any equipment that will be left on the vessel for upcoming cruises.

**3.4 Cruise Plan** – The ship will depart Kodiak, Alaska, on Tuesday, April 6, 2004 in time to complete mooring operations at Chiniak Bay during daylight hours. We will utilize the stern platform as well as the port deck crane during mooring operations. A standard mooring site operation will include a Conductivity, Temperature, and Depth (CTD) cast prior to a mooring recovery and a CTD cast following a mooring deployment.

- **CHINIAK BAY** – One mooring will be recovered and redeployed at Chiniak Bay,
- **GLOBEC** – There are six (6) mooring sites along the GLOBEC line. GLOBEC site 3 (GB-3) has two moorings including a surface mooring; all other GLOBEC sites have one subsurface mooring,
- **GORE POINT** – A CTD grid will be completed in the Gore Point area. Subsequently mooring operations will begin for the three sites along the Gore Point line,
- **SHELIKOF STRAIT** – Three moorings will be recovered and redeployed along Line 8 in Shelikof Strait. The Line 8 CTDs (seven CTDs) will be completed,
- **PAVLOF BAY** – One mooring will be recovered and redeployed, and
- **UNIMAK PASS** – Deploy two drifters.

As time allows we will proceed as follows:

- **FOCI BERING SEA SITE 6** – A mooring will be recovered at site 6,
- **SAMALGA PASS** – Several CTD lines will be completed in the Samalga Pass area. Five moorings will be recovered at Samalga Pass,
- **ALASKA STREAM** – A line of CTDs will be completed across the Alaska Stream. Four moorings will be recovered at the Alaska Stream area, and
- **AMUKTA PASS** – Four moorings will be recovered at Amukta Pass. A line of CTDs will be completed across the Amukta Pass.

The cruise will end in Dutch Harbor, Alaska, on Thursday, April 22, 2004.

**3.5 Station Locations** – See Section [9.4 Cruise MF-04-04 Itinerary](#).

**3.6 Station Operations** – The following are operations to be conducted on this cruise. The procedures for these operations are listed in the ***FOCI Standard Operating Instructions for NOAA Ship MILLER FREEMAN*** (SOI). Operations not addressed in the SOI and changes to standard procedures are addressed below.

- CTD/Water Sample Operations (SOI 3.2.1), and
- Chlorophyll Sampling Operations (SOI 3.2.10).

**3.7 Underway Operations** – The following are underway operations to be conducted on this cruise. The procedures for these operations are listed in the ***FOCI Standard Operating Instructions for NOAA Ship MILLER FREEMAN*** (SOI). Operations not addressed in the SOI and changes to standard procedures are addressed below.

- Acoustic Doppler Current Profiler (ADCP) Operations (SOI 3.2.13),
- Radiometer Operations (SOI 3.2.14),
- Scientific Computer System (SCS) data acquisition (SOI 5.2),
- Fluorometer monitoring (SOI 5.3), and
- Thermosalinograph monitoring (SOI 5.3).

**3.8 Applicable Restrictions** – None

**3.9 Small Boat Operations** – Weather permitting, the small boat may be needed for mooring operations to recover the surface mooring.

## **4.0 FACILITIES**

**4.1 Equipment and Capabilities Provided by Ship**

- Oceanographic winch with 0.322" electro-mechanical cable with slip rings terminated for CTD operations,
- A-Frame(s),
- Ability to connect a PAR and Fluorometer, provided by the project, to the CTD,
- Provide termination kits and ship support personnel to do the terminations,
- Wire speed indicators and readout for winches,
- Electrical connection between winch and Deck computer system,
- Sea-Bird Electronics' SBE 911*plus* CTD system with dual sensors, carousel, stand, deck unit, and weights,
- Sixteen sampling bottles for use with rosette (11 plus 5 spares),
- Refrigerator and freezer space for storage of biological and chemical samples, +4° C (4-cft) for nutrients and -20° C (~12-16-cft) for chlorophyll samples, respectively,
- RD Instruments' ADCP written to disk,
- For meteorological observations: Anemometers, calibrated air thermometer (wet-and dry-bulb) and a calibrated barometer and/or barograph, interfaced to the data logger if possible,
- Bench space for PCs, monitor, and printer,

- Laboratory space with exhaust hood, sink, lab tables, and storage space,
- Sea-water hoses and nozzles to wash nets and recovered mooring equipment at CTD stations,
- Adequate deck lighting for night-time operations,
- Navigational equipment including GPS and radar,
- Safety harnesses for working on quarterdeck and fantail,
- Ship's crane(s) used for loading and/or deploying,
- (2) Hand-held radios for scientific/winch/bridge communications,
- VHF radio with external antenna at CTD computer station,
- Thermosalinograph and fluorometer interfaced with the data logger,
- Continuous uncontaminated Seawater sampling system with debubbler piped from bow into labs,
- Benthos acoustic transducer and deckbox,
- EdgeTech 8011AT deckbox and transducer (hull-mounted),
- Capability to transfer ship's data to CD-ROM disks, and
- Capability to transfer ship's data to Iomega Zip disks or CD-ROM.

#### **4.2 Equipment and Capabilities Provided by Scientists**

- Sea-Bird Electronics' SBE 911*plus* CTD system with dual sensors,
- Photosynthetically Active Radiation (PAR) and Fluorometer to be mounted on CTD,
- CTD stand,
- CTD carousel sampler,
- Debubbler for the fluorometer,
- (1) Surface mooring (FOCI biophysical platforms),
- 14 Subsurface moorings,
- Benthos acoustic release deck-set and transducer,
- EdgeTech acoustic release deck-set and transducer,
- 14 railroad wheel sets to be used as anchors,
- Chain, wire rope, rope, assorted hardware for moorings,
- 2 ARGOS satellite tracked drifter buoys,
- (2) Hand held grapple hooks,
- Mooring drag gear for 7/16" winch wire,
- (2) Hand-held radios for scientific/winch/bridge communications,
- Miscellaneous scientific sampling and processing equipment,
- PMEL CTD Weather Observation Logs, and
- CTD Cast Information/Rosette Log.

### **5.0 DISPOSITION OF DATA AND REPORTS**

**5.1** The following data products will be provided by the ship and included in the data package at the end of the cruise:

- Calibration Sheets for all ship's instruments used,
- SCS files,
- ADCP Iomega Zip and/or recordable compact diskette (CD),

- SCS Event Logs, and
- ADCP Log Sheets.

**5.2** The following data products will be completed by the scientific party:

- CTD Cast Information/Rosette Log, and
- Mooring logs.

**5.3 Pre- and Post-cruise Meetings** – A pre-cruise meeting between the ship's representative and the Chief Scientist will be held before the start of the cruise. Its purpose is to identify the day-to-day requirements of the project in order to best utilize shipboard personnel resources and to identify overtime requirements. A brief meeting of all scientific personnel, the ship's officers, deck and marine tech departments, and other relevant ship's personnel should be held before the vessel reaches the operations area for the purposes of:

1. Introducing new scientific personnel to ship's procedures, proper channels, etc.
2. Discuss operating procedures for deploying various pieces of sampling equipment.
3. Coordinating scientific watch assignments.

## **6.0 ADDITIONAL PROJECTS**

**6.1 Definition** – Ancillary and piggyback projects are secondary to the objectives of the cruise and should be treated as additional investigations. The difference between the two types of secondary projects is that an ancillary project does not have representation aboard and is accomplished by the ship's force.

**6.2 Ancillary Projects** – Any ancillary work done during this project will be accomplished with the concurrence of the Chief Scientist and on a not-to-interfere basis with the programs described in these instructions and in accordance with the *NOAA Fleet Standing Ancillary Instructions*.

**6.3 Piggyback Projects** – None.

## **7.0 HAZARDOUS MATERIALS**

**7.1 HAZMAT Inventory** – See Sections [9.2 Cruise MF-04-04 HAZMAT Inventory by Instrument](#) and [9.3 Cruise MF-04-04 HAZMAT Inventory](#).

**7.2 Material Safety Data Sheet (MSDS)** – All MSDSs can be found on the *OERD HAZMAT Emergency Guidelines – MSDS* compact diskette dated January 15, 2003, supplied to the ship.

**8.0 COMMUNICATIONS** – For scientific projects, the Chief Scientist, or their designated representative, may have access to the ship's communications systems on a cost reimbursable basis.

**8.1 Satellite Communications** – INMARSAT (voice and facsimile) communications are available aboard ship and may be used for personal or business related calls. Arrangements to pay for the calls must be made before calling. Credit card calls are the preferred method of payment. INMARSAT calls can be extremely expensive and the exact cost may not be known until you receive your bill.

**8.1.1 Electronic Mail (E-mail)** – FOCI requests that **NOAA Ship *MILLER FREEMAN*** transmit e-mail at least twice a day. Each embarked personnel will have an e-mail account and address established in their name by the ship.

**8.2 Receiving Scientific Status Reports** – The Chief Scientist may anticipate the need for daily reports on the position of satellite drifters in the study area and on the status of biophysical mooring(s). These will be sent either by facsimile from PMEL over INMARSAT, IRIDIUM phone (PMEL provided), or over the Internet via email from PMEL.

**8.3 Use of Radio Transceivers** – Because it is sometimes necessary for the scientific staff to communicate with other research vessels, commercial vessels, and shore based NOAA facilities, the Chief Scientist or designee may request the use of radio transceivers aboard the vessel.

**8.4 Important Telephone and Facsimile Numbers and E-mail Addresses**

**8.4.1 Pacific Marine Environmental Laboratory (PMEL):**

FOCI – Ocean Environmental Research Division (OERD2):

- (206) 526-4700 (voice)
- (206) 526-6485 (fax)

Administration:

- (206) 526-6810 (voice)
- (206) 526-6815 (fax)

E-Mail: FirstName.LastName@noaa.gov

**8.4.2 NOAA Ship *MILLER FREEMAN*** – Telephone methods listed in order of increasing expense:

Homeport – Seattle, Washington:

- (206) 553-4589
- (206) 553-4581
- (206) 553-8344

United States Coast Guard – Kodiak, Alaska

- (907) 487-9752
- (907) 487-9753
- (907) 487-4397
- (907) 487-4398

Cellular:

- (206) 660-7167

INMARSAT Mini-M

- 011-872-761-267-346 (voice/PBX)
- 011-872-761-267-347 (voice)

INMARSAT B

- 011-872-330-394-120 (voice)
- 011-872-330-394-121 (fax)

E-Mail: [NOAA.Ship.Miller.Freeman@noaa.gov](mailto:NOAA.Ship.Miller.Freeman@noaa.gov) (mention the person's name in SUBJECT field)

**8.4.3 Marine Operations Center, Pacific (MOP):**

Operations Division (MOP1)

- (206) 553-4548 (voice)
- (206) 553-1109 (facsimile)

E-Mail: FirstName.LastName@noaa.gov

E-Mail to Radio Room: [Radio.Room@noaa.gov](mailto:Radio.Room@noaa.gov)

**9.0 APPENDICES**

**9.1 Cruise MF-04-04 Equipment Inventory – To be provided in Final Cruise Instructions.**



## 9.2 Cruise MF-04-04 HAZMAT Inventory by Instrument

Instrument	Battery Type	Manufacturer	Cell Type	Req. Cells	Total Instr.	Spares	Total Cells	Contact Person
RCM-7	Lithium, Bromine Chloride	Leclanche	D-cell	2	10	0	20	Floering
SeaCat (w/Fluor & pump)	Lithium, Bromine Chloride	Wilson Greatbatch	D-cell	9	4	9	45	DeWitt
SeaCat (Seagauge)	Lithium, Bromine Chloride	Wilson Greatbatch	DD-cell	3	4	0	12	DeWitt
MicroCat	Lithium		9-volt	6	20	6	126	DeWitt
MTR	Alkaline		9-volt	1	15	2	17	DeWitt
SBE-39	Lithium	UltraLife	9-volt	1	16	4	20	DeWitt

## 9.3 Cruise MF-04-04 HAZMAT Inventory

Chemical	CAS Number	Contact	Qty	H	F	R	Storage Color Code	Hazard Class	Packing Group Number	UN	Reportable Quantity	Response Indices
Acetone	67-64-1	Mordy	1.0-l	1	4	2	Flammable	3	II	1090	350-LB	1
Brij	9002-92-0	Mordy	30-ml	0	1	0	General	Not regulated			None	2
Cadmium	7440-43-9	Mordy	20-g				Toxic	4.1	III	3178	None	3
Cupric Sulfate	7758-99-8	Mordy	40-g	2	0	0	Hazardous Waste	9	III	3077	400-LB	4
Hydrochloric Acid	7647-01-0	Mordy	5.0-l	3	0	2	Corrosive	8	II	1789	5,000-LB	5
Imidazole	288-32-4	Mordy	300-g	2	1	1	Corrosive	8	III	3263	5-KG	6
N-1-Naphthylethylenediamine Dihydrochloride	1465-25-4	Mordy	8-g	2	1	1	General	Not regulated			None	7
Nitric Acid	7697-37-2	Mordy	20-ml	4	0	3	Corrosive	8	II	2031	150-LB	5
Potassium Nitrate	7757-79-1	Mordy	3-g	1	0	3	Reactive	5.1	III	1486	100-KG	6
Sodium Hydroxide	1310-73-2	Mordy	10-g	3	0	2	Store Separately	8	II	1823	1,000-LB	8
Sodium Nitrite	7632-00-0	Mordy	0.5-g	2	0	3	Reactive	5.1 & 6.1	III	1500	100-LB	9
Sulfanilamide	63-74-1	Mordy	80-g	0	1	1	General	Not regulated			None	10
Tributyltin Oxide	56-35-9	DeWitt	30-pairs				Poison	6.1	II	3020	None	11

**Spill Response 1:** Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e.g., vermiculite, dry sand, or earth), and place in a chemical waste container. Do not use combustible materials, such as sawdust. **Do not flush to sewer!** If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures. U.S. Regulations (CERCLA) requires reporting spills and releases to soil, water, and air in excess of reportable quantities. The toll free number for the U.S. Coast Guard National Response Center is (800) 424-8802.

**Spill Response 2:** Ventilate area of leak or spill. Wear appropriate personal protective equipment. Contain and recover liquid when possible. Collect liquid in an appropriate container or absorb with an inert material (e.g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as sawdust. Do not flush to sewer!

**Spill Response 3:** Evacuate area. Wear Self-Contained Breathing Apparatus (SCBA), rubber boots, and heavy rubber gloves. Wear disposable coveralls and discard them after use. Sweep up, place in bag and hold for waste disposal. Ventilate area and wash spill site after material pickup is complete. Avoid raising dust.

**Spill Response 4:** Ventilate area of leak or spill. Keep unnecessary and unprotected people away from area of spill. Wear appropriate personal protective equipment. Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust. U.S. Regulations (CERCLA) requires reporting spills and releases to soil, water, and air in excess of reportable quantities. The toll free number for the U.S. Coast Guard National Response Center is (800) 424-8802.

**Spill Response 5:** Ventilate area of leak or spill. Wear appropriate personal protective equipment. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e.g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as sawdust. **Do not flush to sewer!** U.S. Regulations (CERCLA) requires reporting spills and releases to soil, water, and air in excess of reportable quantities. The toll free number for the U.S. Coast Guard National Response Center is (800) 424-8802.

**Spill Response 6:** Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment. Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container.

**Spill Response 7:** Ventilate area of leak or spill. Wear appropriate personal protective equipment. Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust.

**Spill Response 8:** Ventilate area of leak or spill. Keep unnecessary and unprotected people away from area of spill. Wear appropriate personal protective equipment. Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust. **Do not flush caustic residues to the sewer!** Residues from spills can be diluted with water, neutralized with dilute acid such as acetic, hydrochloric, or sulfuric. Absorb neutralized caustic residue on clay, vermiculite or other inert substance and package in a suitable container for disposal. U.S. Regulations (CERCLA) requires reporting spills and releases to soil, water, and air in excess of reportable quantities. The toll free number for the U.S. Coast Guard National Response Center is (800) 424-8802.

**Spill Response 9:** Remove all sources of ignition. Ventilate area of leak or spill. Wear appropriate personal protective equipment. Clean up spills in a manner that does not disperse dust into the air. Use non-sparking tools and equipment. Reduce airborne dust and prevent scattering by moistening with water. Pick up spill for recovery or disposal and place in a closed container. U.S. Regulations (CERCLA) requires reporting spills and releases to soil, water, and air in excess of reportable quantities. The toll free number for the U.S. Coast Guard National Response Center is (800) 424-8802.

**Spill Response 10:** Ventilate area of leak or spill. Wear appropriate personal protective equipment. Sweep up and containerize for reclamation or disposal. Vacuuming or wet sweeping may be used to avoid dust dispersal. Place material in closed container.

**Spill Response 11:** Stop the leak, if possible. Ventilate the space involved. Absorb, sweep up, and place in container for disposal. Shut off or remove all ignition sources. Prevent waterway contamination. Construct a dike to prevent spreading. Collect run-off (water) and transfer to drums or tanks for later disposal.

#### 9.4 Cruise MF-04-04 Itinerary

Activity	Latitude			Longitude			Dist. (nm)	Spd (kts)	Trans (hrs)	Bottom Depth (m)	On Sta (hrs)	Arrive Date/Time	Depart Date/Time
<b>Depart Kodiak, AK</b>	57°	43.728'	N	152°	31.297'	W							4/6/2004 12:00
CTD CB-1	57°	43.348'	N	152°	17.650'	W	3.6	10	0.4	183	0.0	4/6/2004 13:32	4/6/2004 13:32
Recover 03CB-1B	57°	43.348'	N	152°	17.650'	W	0.0	10	0.0	183	1.0	4/6/2004 13:32	4/6/2004 14:32
Deploy 04CB-1A	57°	43.348'	N	152°	17.650'	W	0.0	10	0.0	183	2.0	4/6/2004 14:32	4/6/2004 16:32
CTD CB-1	57°	43.348'	N	152°	17.650'	W	0.0	10	0.0	183	0.5	4/6/2004 16:32	4/6/2004 17:02
CTD at GBP-12	58°	41.016'	N	148°	50.862'	W	123.3	10	12.3	201	0.5	4/7/2004 5:22	4/7/2004 5:52
Recover 03GBP-12B	58°	41.016'	N	148°	50.862'	W	0.0	10	0.0	201	1.0	4/7/2004 5:52	4/7/2004 6:52
Deploy 04GBP-12A	58°	41.016'	N	148°	50.862'	W	0.0	10	0.0	201	2.0	4/7/2004 6:52	4/7/2004 8:52
CTD at GBP-12	58°	41.016'	N	148°	50.862'	W	0.0	10	0.0	201	0.5	4/7/2004 8:52	4/7/2004 9:22
CTD at GBP-5	59°	02.528'	N	148°	41.600'	W	22.0	10	2.2	194	0.5	4/7/2004 11:34	4/7/2004 12:04
Recover 03GBP-5B	59°	02.528'	N	148°	41.600'	W	0.0	10	0.0	194	1.0	4/7/2004 12:04	4/7/2004 13:04
Deploy 04GBP-5A	59°	02.528'	N	148°	41.600'	W	0.0	10	0.0	194	2.0	4/7/2004 13:04	4/7/2004 15:04
CTD at GBP-5	59°	02.528'	N	148°	41.600'	W	0.0	10	0.0	194	0.5	4/7/2004 15:04	4/7/2004 15:34
CTD at GB-4	59°	07.660'	N	148°	45.646'	W	5.5	10	0.6	146	0.5	4/7/2004 16:07	4/7/2004 16:37
Recover 03GB-4B	59°	07.660'	N	148°	45.646'	W	0.0	10	0.0	146	1.0	4/7/2004 16:37	4/7/2004 17:37
Deploy 04GB-4A	59°	07.660'	N	148°	45.646'	W	0.0	10	0.0	146	2.0	4/7/2004 17:37	4/7/2004 19:37

Activity	Latitude	Longitude	Dist. (nm)	Spd (kts)	Trans (hrs)	Bottom Depth (m)	On Sta (hrs)	Arrive Date/Time	Depart Date/Time
CTD at GB-4	59° 07.660' N	148° 45.646' W	0.0	10	0.0	146	0.5	4/7/2004 19:37	4/7/2004 20:07
CTD at GB-3	59° 17.910' N	148° 57.799' W	12.0	10	1.2	185	0.5	4/7/2004 21:19	4/7/2004 21:49
Recover 03GBM-3B	59° 17.910' N	148° 57.799' W	0.0	10	0.0	185	12.0	4/7/2004 21:49	4/8/2004 9:49
Deploy 04GBM-3A	59° 17.910' N	148° 57.799' W	0.0	10	0.0	185	4.0	4/8/2004 9:49	4/8/2004 13:49
Recover 03GBP-3B	59° 17.020' N	148° 57.517' W	0.9	10	0.1	185	1.0	4/8/2004 13:55	4/8/2004 14:55
Deploy 04GBP-3A	59° 17.020' N	148° 57.517' W	0.0	10	0.0	185	2.0	4/8/2004 14:55	4/8/2004 16:55
CTD at GB-3	59° 17.020' N	148° 57.517' W	0.0	10	0.0	185	0.5	4/8/2004 16:55	4/8/2004 17:25
CTD at GB-2	59° 32.018' N	149° 10.994' W	16.5	10	1.6	212	0.5	4/8/2004 19:04	4/8/2004 19:34
Recover 03GB-2B	59° 32.018' N	149° 10.994' W	0.0	10	0.0	212	11.0	4/8/2004 19:34	4/9/2004 6:34
Deploy 04GB-2A	59° 32.018' N	149° 10.994' W	0.0	10	0.0	212	2.0	4/9/2004 6:34	4/9/2004 8:34
CTD at GB-2	59° 32.018' N	149° 10.994' W	0.0	10	0.0	212	0.5	4/9/2004 8:34	4/9/2004 9:04
CTD at GB-1	59° 41.680' N	149° 19.904' W	10.7	10	1.1	228	0.5	4/9/2004 10:08	4/9/2004 10:38
Recover 03GB-1B	59° 41.680' N	149° 19.904' W	0.0	10	0.0	228	1.0	4/9/2004 10:38	4/9/2004 11:38
Deploy 04GB-1A	59° 41.680' N	149° 19.904' W	0.0	10	0.0	228	2.0	4/9/2004 11:38	4/9/2004 13:38
CTD at GB-1	59° 41.680' N	149° 19.904' W	0.0	10	0.0	228	0.5	4/9/2004 13:38	4/9/2004 14:08
CTD box at Gore Point	59° 06.029' N	150° 59.399' W	61.9	10	6.2	230	25.0	4/9/2004 20:19	4/10/2004 21:19
CTD at GP-32	59° 06.029' N	150° 59.399' W	49.0	10	4.9	165	0.5	4/11/2004 7:07	4/11/2004 7:37
Recover 03GP-32B	59° 06.029' N	150° 59.399' W	0.0	10	0.0	165	9.0	4/11/2004 7:37	4/11/2004 16:37
Deploy 04GP-32A	59° 06.029' N	150° 59.399' W	0.0	10	0.0	165	1.5	4/11/2004 16:37	4/11/2004 18:07
CTD at GP-32	59° 06.029' N	150° 59.399' W	0.0	10	0.0	165	0.5	4/11/2004 18:07	4/11/2004 18:37
CTD at GP-34	58° 57.775' N	150° 55.981' W	8.4	10	0.8	140	0.5	4/11/2004 19:27	4/11/2004 19:57
Recover 03GP-34B	58° 57.775' N	150° 55.981' W	0.0	10	0.0	140	1.0	4/11/2004 19:57	4/11/2004 20:57
Deploy 04GP-34A	58° 57.775' N	150° 55.981' W	0.0	10	0.0	140	1.5	4/11/2004 20:57	4/11/2004 22:27
CTD at GP-34	58° 57.775' N	150° 55.981' W	0.0	10	0.0	140	0.5	4/11/2004 22:27	4/11/2004 22:57
CTD at GPP-36	58° 45.020' N	150° 52.010' W	12.9	10	1.3	181	0.5	4/12/2004 0:15	4/12/2004 0:45
Recover 03GPP-36B	58° 45.020' N	150° 52.010' W	0.0	10	0.0	181	1.0	4/12/2004 0:45	4/12/2004 1:45
Deploy 04GPP-36A	58° 45.020' N	150° 52.010' W	0.0	10	0.0	181	1.5	4/12/2004 1:45	4/12/2004 3:15
CTD at GPP-36	58° 45.020' N	150° 52.010' W	0.0	10	0.0	181	0.5	4/12/2004 3:15	4/12/2004 3:45
WP-028	58° 44.736' N	152° 35.793' W	53.8	12	4.5	182	0.0	4/12/2004 8:14	4/12/2004 8:14
CTD at SSP-3	57° 29.022' N	154° 48.450' W	103.2	12	8.6	191	0.5	4/12/2004 16:50	4/12/2004 17:20
Recover 03SSP-3B	57° 29.022' N	154° 48.450' W	0.0	10	0.0	191	1.0	4/12/2004 17:20	4/12/2004 18:20
Deploy 04SSP-3A	57° 29.022' N	154° 48.450' W	0.0	10	0.0	191	1.5	4/12/2004 18:20	4/12/2004 19:50
CTD at SSP-3	57° 29.022' N	154° 48.450' W	0.0	10	0.0	191	0.5	4/12/2004 19:50	4/12/2004 20:20

Activity	Latitude		Longitude		Dist. (nm)	Spd (kts)	Trans (hrs)	Bottom Depth (m)	On Sta (hrs)	Arrive Date/Time	Depart Date/Time
CTD at SSP-2	57°	37.120' N	155°	04.490' W	11.8	10	1.2	249	0.5	4/12/2004 21:31	4/12/2004 22:01
Recover 03SSP-2B	57°	37.120' N	155°	04.490' W	0.0	10	0.0	249	1.0	4/12/2004 22:01	4/12/2004 23:01
Deploy 04SSP-2A	57°	37.120' N	155°	04.490' W	0.0	10	0.0	249	1.5	4/12/2004 23:01	4/13/2004 0:31
CTD at SSP-2	57°	37.120' N	155°	04.490' W	0.0	10	0.0	249	0.5	4/13/2004 0:31	4/13/2004 1:01
CTD at SSP-1	57°	41.072' N	155°	12.196' W	5.7	10	0.6	295	0.6	4/13/2004 1:35	4/13/2004 2:11
Recover 03SSP-1B	57°	41.072' N	155°	12.196' W	0.0	10	0.0	295	1.0	4/13/2004 2:11	4/13/2004 3:11
Deploy 04SSP-1A	57°	41.072' N	155°	12.196' W	0.0	10	0.0	295	1.5	4/13/2004 3:11	4/13/2004 4:41
CTD at SSP-1	57°	41.072' N	155°	12.196' W	0.0	10	0.0	295	0.6	4/13/2004 4:41	4/13/2004 5:17
CTD at Line 8, Station 61	57°	43.200' N	155°	15.600' W	2.8	10	0.3	200	0.5	4/13/2004 5:34	4/13/2004 6:04
CTD at Line 8, Station 60	57°	41.000' N	155°	10.000' W	3.7	10	0.4	200	0.5	4/13/2004 6:26	4/13/2004 6:56
CTD at Line 8, Station 59	57°	38.500' N	155°	04.200' W	4.0	10	0.4	200	0.5	4/13/2004 7:20	4/13/2004 7:50
CTD at Line 8, Station 58	57°	36.300' N	155°	00.500' W	3.0	10	0.3	200	0.5	4/13/2004 8:08	4/13/2004 8:38
CTD at Line 8, Station 57	57°	33.100' N	154°	52.500' W	5.4	10	0.5	200	0.5	4/13/2004 9:10	4/13/2004 9:40
CTD at Line 8, Station 56	57°	30.900' N	154°	47.000' W	3.7	10	0.4	200	0.5	4/13/2004 10:02	4/13/2004 10:32
CTD at Line 8, Station 55	57°	28.500' N	154°	42.000' W	3.6	10	0.4	200	0.5	4/13/2004 10:54	4/13/2004 11:24
CTD at Pavlof Bay	55°	10.866' N	161°	41.191' W	3.3	6	0.5	100	0.4	4/14/2004 17:08	4/14/2004 17:32
Recover 03PA-1A	55°	10.866' N	161°	41.191' W	0.0	10	0.0	100	1.0	4/14/2004 17:32	4/14/2004 18:32
Deploy 04PA-1A	55°	10.866' N	161°	41.191' W	0.0	10	0.0	100	1.0	4/14/2004 18:32	4/14/2004 19:32
CTD at Pavlof Bay	55°	10.866' N	161°	41.191' W	0.0	10	0.0	100	0.4	4/14/2004 19:32	4/14/2004 19:56
WP-054	55°	12.227' N	161°	46.396' W	3.3	6	0.5		0.0	4/14/2004 20:29	4/14/2004 20:29
Unimak Pass drifter deployment	54°	18.070' N	164°	44.630' W	85.5	10	8.6	101	0.5	4/15/2004 16:34	4/15/2004 17:04
CTD at BS-6	53°	24.358' N	168°	51.234' W	73.8	10	7.4	996	1.1	4/16/2004 9:08	4/16/2004 10:14
Recover 03BS-6A	53°	24.358' N	168°	51.234' W	0.0	10	0.0	996	1.0	4/16/2004 10:14	4/16/2004 11:14
CTD lines at Samalga Pass	52°	59.000' N	169°	35.500' W	36.7	10	3.7	120	12.0	4/16/2004 14:54	4/17/2004 2:54
Recover 03SG-2A	52°	59.000' N	169°	35.500' W	0.0	10	0.0	120	1.0	4/17/2004 2:54	4/17/2004 3:54
CTD at SG-2	52°	59.000' N	169°	35.500' W	0.0	10	0.0	120	0.5	4/17/2004 3:54	4/17/2004 4:24
Recover 03SGP-1B	52°	50.500' N	169°	27.500' W	9.8	10	1.0	230	1.0	4/17/2004 5:23	4/17/2004 6:23
CTD/nutrients at SGP-1	52°	50.500' N	169°	27.500' W	0.0	10	0.0	230	0.5	4/17/2004 6:23	4/17/2004 6:53
Recover 03SG-3B	52°	59.000' N	169°	09.500' W	13.8	10	1.4	120	1.0	4/17/2004 8:16	4/17/2004 9:16
CTD at SG-3	52°	59.000' N	169°	09.500' W	0.0	10	0.0	120	0.5	4/17/2004 9:16	4/17/2004 9:46
Recover 03SG-5B	52°	42.400' N	169°	22.000' W	18.2	10	1.8	120	1.0	4/17/2004 11:35	4/17/2004 12:35
CTD at SG-5	52°	42.400' N	169°	22.000' W	0.0	10	0.0	120	0.5	4/17/2004 12:35	4/17/2004 13:05
Recover 03SG-4A	52°	41.500' N	169°	34.000' W	7.3	10	0.7	120	1.0	4/17/2004 13:49	4/17/2004 14:49

Activity	Latitude		Longitude		Dist. (nm)	Spd (kts)	Trans (hrs)	Bottom Depth (m)	On Sta (hrs)	Arrive Date/Time	Depart Date/Time
CTD at SG-4	52°	41.500' N	169°	34.000' W	0.0	10	0.0	120	0.5	4/17/2004 14:49	4/17/2004 15:19
Alaska Stream CTD line	52°	41.000' N	168°	48.500' W	27.6	10	2.8	102	31.0	4/17/2004 18:04	4/19/2004 1:04
CTD at GSP-6	52°	41.000' N	168°	48.500' W	0.0	10	0.0	103	0.4	4/19/2004 1:04	4/19/2004 1:28
Recover 03GSP-6A	52°	41.000' N	168°	48.500' W	0.0	10	0.0	1017	1.0	4/19/2004 1:28	4/19/2004 2:28
CTD at GSP-7	52°	32.500' N	168°	37.500' W	10.8	10	1.1	2850	1.5	4/19/2004 3:33	4/19/2004 5:03
Recover 03GSP-7A	52°	32.500' N	168°	37.500' W	0.0	10	0.0	2850	2.0	4/19/2004 5:03	4/19/2004 7:03
CTD at GSP-8	52°	23.500' N	168°	26.700' W	11.1	10	1.1	3340	1.5	4/19/2004 8:10	4/19/2004 9:40
Recover 03GSP-8A	52°	23.500' N	168°	26.700' W	0.0	10	0.0	3340	2.5	4/19/2004 9:40	4/19/2004 12:10
CTD at GSP-9	52°	11.000' N	168°	14.500' W	14.6	10	1.5	4350	1.5	4/19/2004 13:38	4/19/2004 15:08
Recover 03GSP-9A	52°	11.000' N	168°	14.500' W	0.0	10	0.0	4350	2.5	4/19/2004 15:08	4/19/2004 17:38
CTD at AMP-1	52°	26.139' N	171°	27.311' W	118.8	12	9.9	421	0.7	4/20/2004 3:32	4/20/2004 4:14
CTD at AMP-2	52°	25.003' N	171°	39.955' W	7.8	12	0.6	459	0.7	4/20/2004 4:53	4/20/2004 5:35
CTD at AMP-3	52°	23.996' N	171°	54.986' W	9.2	12	0.8	308	0.6	4/20/2004 6:21	4/20/2004 6:57
CTD at AMP-4	52°	22.967' N	172°	07.186' W	7.5	12	0.6	365	0.6	4/20/2004 7:34	4/20/2004 8:10
Recover 03AMP-4A	52°	22.967' N	172°	07.186' W	0.0	12	0.0	365	1.7	4/20/2004 8:10	4/20/2004 9:52
Recover 03AMP-3A	52°	23.996' N	171°	54.986' W	7.5	12	0.6	308	0.7	4/20/2004 10:30	4/20/2004 11:12
Recover 03AMP-2A	52°	25.003' N	171°	39.955' W	9.2	12	0.8	459	0.7	4/20/2004 11:58	4/20/2004 12:40
Recover 03AMP-1A	52°	26.139' N	171°	27.311' W	7.8	12	0.6	421	0.7	4/20/2004 13:19	4/20/2004 14:01
WX Down Time	52°	26.139' N	171°	27.311' W	0.0	10	0.0	340	24.0	4/20/2004 14:01	4/21/2004 14:01
Arrive Dutch Harbor, AK	53°	53.652' N	166°	30.597' W	1.1	6	0.2	69	0.0	4/22/2004 11:54	

# 9.5 Cruise MF-04-04 Route Chartlet

